SPENVIS-NG Human Machine Interface Development

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SPENVIS-NG HMI OBJECTIVES

The key objective of SPENVIS-NG ESA project is the upgrading of the current SPENVIS system into a new web-based service-oriented distributed framework supporting plug-in of models related to the hazardous Space Environment.

We introduce the brand new HMI that is implemented using the latest state-of-the art technologies; the new solution will increase the reliability, security and stability of the current SPENVIS-4 HMI which has become old-fashioned.

Also the system is modular and flexible enough to support an advanced interface for user and content management, the addition of new features such as new data analysis, workflow editor and visualization improvements, compliant with the proposed architecture. These capabilities will be easy enough to be used by a non-software skilled person.
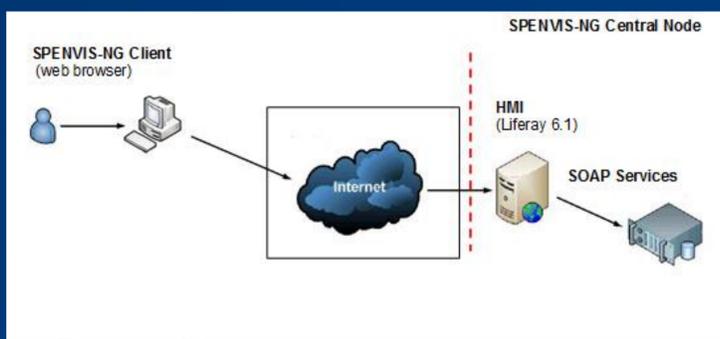

SPENVIS-NG Context Diagram

COMPONENT-BASED ARCHITECTURE

SPENVIS-NG is implemented as a component-based software architecture where components are designed to be configurable so that each instance can be deployed on a different node in a geographically distributed environment.

The HMI can be deployed independently too:

• SPENVIS-NG users will connect using a web browser to the HMI web interface available online.

•The HMI will be deployed in the Central Node, where all persistent data such as project management, user management, remote node management, central repository and resource repository is stored. Central node is orchestrating the execution of the models on the remote nodes.

• The HMI will access those repositories using well-defined SOAP interfaces to retrieve all data presented to end-users.
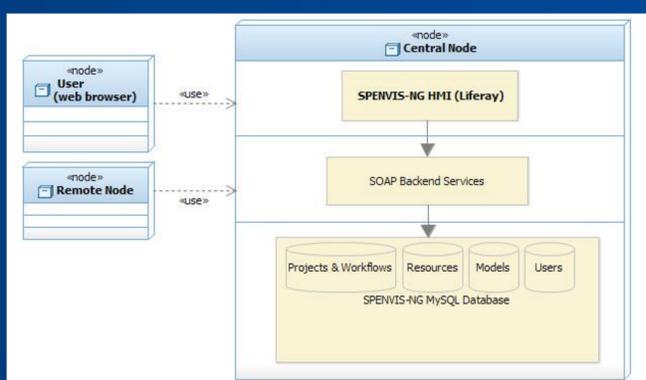
SPENVIS-NG Proposed Architecture

END USERS SERVICES PROVIDED

The following capabilities will be accessible through the HMI:

• Provide authentication and authorization mechanisms that allow managing different users and their associated metadata and roles allowing administrators to configure the set of features that can be accessed for each role and also allowing each user to personalize her/his view according to their needs.

• Allow users to display and manage their own projects and the resources and workflows associated with each project; the HMI will interact with the Workflow execution Engine to schedule/stop/pause workflow executions and with the SPENVIS-NG database to retrieve and display to the user results of previous runs.

• Allow users to display and manage the list of all available models/tools grouped by domain and allowing visualization of their execution status.

• Allow administrators to manage content provided by the HMI such as SPENVIS-NG documentation or access to the Helpdesk support pages, as well providing access to several collaboration and social platform utilities such as bug tracker, forum etc…

SPENVIS-NG HMI Frontend

STATE OF THE ART TECHNOLOGIES

Regarding technologies used in the implementation, the usage of the latest state-of-the-art technologies available in the market for building web applications is mandatory as well as the extensive usage of standard protocols for communications with server-side layers like SOAP over HTTPs via XML messages. Also support of security, authentication and session management is a must.

The final solution ensures portability to the most common platforms (Windows, UNIX/Linux-like and MacOS X systems) and major web browsers (Internet Explorer, Mozilla Firefox, Google Chrome, Apple Safari, Opera, etc…).

The implementation of SPENVIS-NG HMI is based on Liferay Community framework (http://www.liferay.com/) and deployed using Glassfish J2EE engine (http://glassfish.java.net/). HTML5/AJAX APIs such as jQuery (http://jquery.com/) or Dojo JS (http://dojotoolkit.org/) are used to provide advanced display capabilities.

SPENVIS-NG HMI is expected to be deployed and fully operational by mid-2014 together with SPENVIS-NG backend implementations